

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
20 October 2005 (20.10.2005)

PCT

(10) International Publication Number
WO 2005/098257 A2

(51) International Patent Classification⁷: **F16D 37/00**

(21) International Application Number:
PCT/US2005/011346

(22) International Filing Date: 1 April 2005 (01.04.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/558,140 1 April 2004 (01.04.2004) US

(71) Applicants (for all designated States except US): **GENERAL MOTORS CORPORATION** [US/US]; P.O. Box 300 Renaissance Center, Detroit, MI 48265-3000 (US). **BEHR AMERICA, INC.** [US/US]; 1307 Highview Drive, Webberville, MI 48892 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SMITH, Anthony, L.** [US/US]; 4684 Whitesell Drive, Troy, MI 48098 (US).

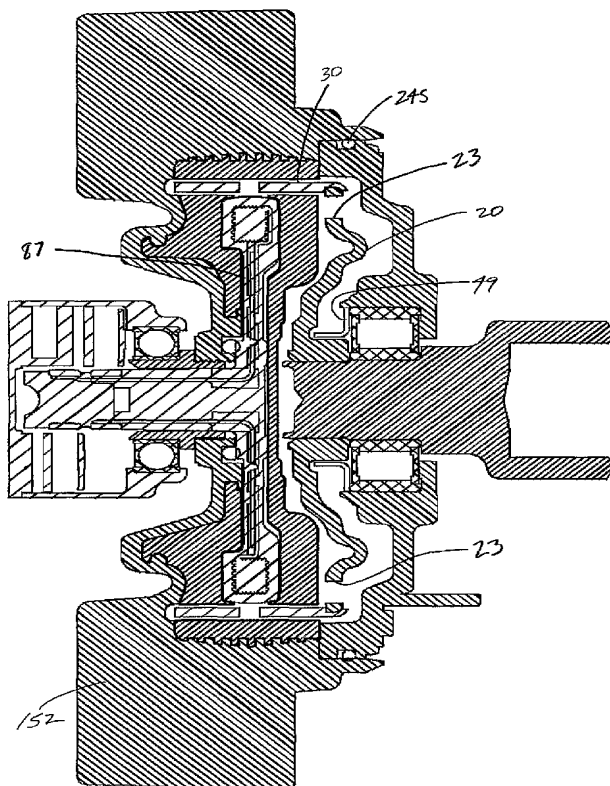
ULICNY, John, C. [US/US]; 1771 Huron Court, Oxford, MI 48371 (US). **KENNEDY, Lawrence, C.** [US/US]; 4865 Ledgewood Drive, Commerce Twp., MI 48382 (US). **McDERMOTT, Brian, L.** [US/US]; 120 Pickford, Novi, MI 48377 (US).

(74) Agents: **SCHWAAB, Richard, L.** et al.; Foley & Lardner LLP, Washington Harbour, 3000 K Street, N.W., Suite 500, Washington, DC 20007-5143 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: CLUTCH ASSEMBLY



(57) Abstract: A viscous fluid clutch for use as a clutch for a cooling fan for a vehicle, the clutch includes an input shaft, a rotor assembly, a first housing portion, a second housing portion, a coil assembly, and a brush box. The rotor assembly is coupled to the input shaft. The first housing portion is coupled to the second housing portion and the second housing portion is rotatably disposed on the input shaft. The first and second housing portions define a fluid reservoir for receiving the rotor assembly and a viscous fluid, preferably of the magnetorheological type. The coil assembly is coupled to the first housing portion. The brush box is operably coupled to the coil assembly. When the coil assembly is energized by the brush box, a magnetic field is created that acts upon the magnetorheological fluid to vary the torque transfer of the input shaft to the housing and the fan connected thereto.



(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.